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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Tamotsu Morimoto

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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA, VA 22314

EXAMINER

CROWELL, ANNA M

ART UNIT

PAPER NUMBER

1792

NOTIFICATION DATE

DELIVERY MODE

06/26/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/796,116	<b>Applicant(s)</b> MORIMOTO ET AL.	
	<b>Examiner</b> Michelle Crowell	<b>Art Unit</b> 1792	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 February 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 1-6 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 7-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claim 7, 9, and 11-14 are rejected under 35 U.S.C. 102(a) as being anticipated by Numazawa et al. (J.P. 2002-343787).

Referring to Drawings 1 & 2 and paragraphs [0024], [0031]-[0032], [0037]-[0038], [0041]-[0042], and [0047], Numazawa et al. discloses a plasma processing apparatus comprising: a lower electrode 14 for placing an object 12 to be processed thereon (par.[0024]); an upper electrode 13 disposed above the lower electrode 14 so as to oppose it (par.[0024]); an adjusting mechanism 35 for adjusting a spacing between the upper and lower electrodes 13, 14 by raising or lowering the lower electrode, the adjusting mechanism including a driving mechanism 35 (par.[0028]); and a high-frequency power supply 32 for applying high-frequency power to at least one of the upper and lower electrodes 13, the high-frequency power being applied to either one of the electrodes to cause plasma igniting (par.[0024]), wherein the drive mechanism maintains the spacing at a first spacing (Drawing 1) after the time of plasma ignition, wherein the drive mechanism 35, sets the spacing from a first spacing (Drawing 1) to a second spacing (Drawing 2) before the time of plasma extinction and after the time of plasma ignition, and the second spacing is larger than the first spacing (par.[0047]).

With respect to claim 9, the plasma processing apparatus of Numazawa et al. further includes that the adjusting mechanism 35 has a drive mechanism for moving the lower electrode away from the upper electrode (par.[0038]).

With respect to claim 11, the plasma processing apparatus of Numazawa et al. further includes that etching is performed as the plasma processing (par.[0041]).

With respect to claim 12, the plasma processing apparatus of Numazawa et al. further includes wherein the driving mechanism sets the spacing to the first spacing (upper limit position) after the time of plasma ignition (paragraph [0047] of Numazawa et al.).

With respect to claim 13, the drive mechanism maintains the spacing at a constant third spacing (substrate transportation), which is larger than the first spacing, for an initial period of time immediately after the time of plasma ignition and before setting the spacing at the first spacing (paragraphs [0037]-[0038], and [0047] of Numazawa et al., Note. The lower electrode is set to the lower limit position after CVD, during substrate transportation, and after plasma ignition for cleaning).

With respect to claim 14, wherein the third spacing (lower limit position) is equal to the second spacing (lower limit position) (paragraphs [0037]-[0038], and [0047] of Numazawa et al.).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 7-9 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koshiishi et al. (U.S. 5,919,332) in view of Numazawa et al. (J.P. 2002-343787) and Yada et al. (J.P. 2002-359203).

Referring to Figure 1 and column 9, line 7-column 11, line 36, Koshiishi et al. discloses a plasma processing apparatus comprising: a lower electrode 6 for placing an object W to be processed thereon (col. 9, lines 16-19); an upper electrode 21 disposed above the lower electrode 6 so as to oppose it (col. 9, lines 66-67); an adjusting mechanism 7 for adjusting a spacing between the upper and lower electrodes 21, 6 by raising or lowering the lower electrode, the adjusting mechanism including a driving mechanism 8 (col. 9, lines 20-27); and a high-frequency power supply 47, 44 for applying high-frequency power to at least one of the upper and lower electrodes 21, 6 the high-frequency power being applied to either one of the electrodes to cause plasma igniting (col. 11, lines 23-29).

Koshiishi et al. fail to teach wherein the drive mechanism maintains the spacing at a first spacing after the time of plasma ignition and the drive mechanism sets the spacing from a first spacing to a second spacing before the time of plasma extinction and after the time of plasma ignition, and the second spacing is larger than the first spacing.

Referring to Drawings 1 & 2 and paragraphs [0024], [0031]-[0032], [0037]-[0038], [0041]-[0042], and [0047] of Numazawa et al. or paragraph [0046] of Numazawa et al. or Yada et al. teach a drive mechanism 35 of Numazawa et al. or 8,9 of Yada et al. teaches wherein the drive mechanism maintains the spacing at a first spacing after the time of plasma ignition and sets the spacing from a first spacing to a second spacing before the time of plasma extinction and after the time of plasma ignition, and the second spacing is larger than the first spacing. For example, in Numazawa et al. the spacing increases during plasma processing and in Yada et al. the spacing changes from 0.8 cm to 1.5 cm (or 0.8 cm to 4.0 cm) during plasma processing. By adjusting the electrode spacing, optimal plasma processing conditions can be achieved. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the drive mechanism of Koshiishi et al. to maintain the spacing at a first spacing after the time of plasma ignition and to set the spacing from a first spacing to a second spacing before the time of plasma extinction and after the time of plasma ignition, and the second spacing is larger than the first spacing as taught by Numazawa et al. or Yada et al. in order to achieve optimal plasma processing conditions.

With respect to claim 8, the plasma processing apparatus of Koshiishi et al. further comprising: a first high-frequency power supply 247 for applying first high-frequency power to

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the upper electrode 21 (col. 9, lines 23-29); and a second high-frequency power supply 44 for applying second high-frequency power having a lower frequency than the first high-frequency power to the lower electrode (col. 9, lines 17-23).

With respect to claim 9, the plasma processing apparatus of Koshiishi et al. further includes that the adjusting mechanism 7, 8 has a drive mechanism for moving the lower electrode away from the upper electrode (col. 9, lines 20-27).

With respect to claim 11, the plasma processing apparatus of Koshiishi et al. further includes that etching is performed as the plasma processing (col. 9, lines 7-9).

With respect to claim 12, the plasma processing apparatus of Koshiishi et al. in view of Numazawa et al. and Yada et al. further includes wherein the driving mechanism sets the spacing to the first spacing (0.8 cm) after the time of plasma ignition (par. [0047]) of Numazawa et al., paragraph [0046] of Yada et al.).

With respect to claim 13, the drive mechanism of Koshiishi et al. in view of Numazawa et al. and Yada et al. maintains the spacing at a constant third spacing (substrate transportation), which is larger than the first spacing, for an initial period of time immediately after the time of plasma ignition and before setting the spacing at the first spacing (paragraph [0046] of Yada et al., third spacing 4 cm, first spacing is 0.8 cm, paragraphs [0037]-[0038], and [0047] of Numazawa et al., Note. In Numazawa et al., the lower electrode is set to the lower limit position after CVD, during substrate transportation, and after plasma ignition for cleaning).

With respect to claim 14, wherein the third spacing (lower limit position) of Koshiishi et al. in view of Numazawa et al. is equal to the second spacing (lower limit position) (paragraphs [0037]-[0038], and [0047] of Numazawa et al.).

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koshiishi et al. (U.S. 5,919,332) in view of Numazawa et al. (J.P. 2002-343787) and Yada et al. (J.P. 2002-359203) as applied to claims 7-9 and 11-12 above, and further in view of Tsuchiya et al. (U.S. 5,716, 534).

The teachings of Koshiishi et al. in view of Numazawa et al. or Yada et al. have been discussed above.

Koshiishi et al. in view of Numazawa et al. or Yada et al. fail to specifically teach that the first high-frequency power is turned off after the second high-frequency power is turned off.

Referring to column 12, line 66-column 13, line 8, Tsuchiya et al. teaches a plasma processing apparatus wherein the first high-frequency power is turned off after the second high-frequency power is turned off so that the charges accumulated on the object can be removed. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention for the first high-frequency power of Koshiishi et al. in view of Numazawa et al. or Yada et al. to be turned off after the second high-frequency power is turned off as taught by Tsuchiya et al. so that the charges accumulated on the object can be removed.



***Response to Arguments***

7. Applicant's arguments with respect to claims 7-14 have been considered but are moot in view of the new ground(s) of rejection.
8. With respect to the Haji, the arguments are moot since the reference has been dropped from the final rejection.
9. With respect to Yada, applicant has argued that Yada fails to teach a drive mechanism that sets the spacing from the first spacing directly to the second spacing, which is larger than the first spacing; however, in Yada the first spacing is set to 0.8 cm (which is the smallest inter-electrode distance) and the second spacing is 1.5 cm which is larger than the first spacing (par. [0046]). The first spacing is maintained before direct setting to the second larger spacing. Thus, the combination of Koshiishi et al. in view of Yada satisfies the claim 7 requirement.

***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (571) 272-1432. The examiner can normally be reached on M-F (9:30 -6:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michelle Crowell/  
Examiner, Art Unit 1792

/Parviz Hassanzadeh/  
Supervisory Patent Examiner, Art Unit 1792